

WHAT IS CLAIMED IS

1. A high strength aluminum alloy casting obtained by casting an aluminum alloy comprised of 7.5 to 11.5 wt% of Si, 3.8 to 4.8 wt% of Cu, 0.45 to 0.65 wt% of Mg, 0.4 to 0.7 wt% of Fe, 0.35 to 0.45 wt% of Mn, and the balance of Al and not more than 0.2 wt% of unavoidable impurities,

wherein this aluminum alloy has 0.1 to 0.3 wt% of Ag added to it.

2. A high strength aluminum alloy casting obtained by casting an aluminum alloy comprised of 7.5 to 11.5 wt% of Si, 3.8 to 4.8 wt% of Cu, 0.45 to 0.65 wt% of Mg, 0.4 to 0.7 wt% of Fe, 0.35 to 0.45 wt% of Mn, and the balance of Al and not more than 0.2 wt% of unavoidable impurities,

wherein this aluminum alloy contains 0.1 to 1.0 wt% of at least one element selected from the group of second additive elements comprised of Rb, K, Ba, Sr, Zr, Nb, Ta, V, and Pd and rare earth elements.

3. A high strength aluminum alloy casting as set forth in claim 1 or 2, wherein:

an amount of gas included in said high strength aluminum alloy casting is kept to not more than 1.5 cm³ with respect to 100 g of the high strength aluminum alloy casting and

solubilization and age hardening are performed to enhance the strength.

4. A high strength aluminum alloy casting as set forth in claim 2, wherein when casting, die casting or heat treating said rare earth element reacts with molten hydrogen in the aluminum alloy to form a compound and suppress casting defects arising due to the molten hydrogen.

5. A high strength aluminum alloy casting as set forth in any one of claims 1 to 3, wherein said rare earth element is at least one element selected from the group comprising La, Ce, Pr, Nb, Pm, Sm, Eu, Ga, Tb, Dy,

Ho, Er, Tm, Yb, Lu, Y, and Sc.

6. A high strength aluminum alloy casting as set forth in any one of claims 1 to 5, wherein said high strength aluminum alloy casting is solubilized by heating in a temperature range of 495 to 505°C for 2 to 6 hours, then quenched and further then age hardened by heating in a temperature range of 160 to 220°C for 2 to 6 hours.

7. A high strength aluminum alloy casting as set forth in claim 6, wherein said solubilized and age hardened high strength aluminum alloy casting has eutectic Si of a particle size of an average not more than 15 μm preferably not more than 12 μm , a Cu compound of a particle size of not more than an average 8 μm , an Mg-Si compound of a particle size of not more than an average 12 μm , and an Fe compound of a particle size of not more than an average 6 μm .

8. A method of production of a high strength aluminum alloy casting as set forth in any one of claims 1 to 7, comprising the steps of:

filling a melt of an aluminum alloy in a mold to obtain a casting,

taking out the aluminum alloy casting from the mold,

solubilizing the high strength aluminum alloy casting by heating in a temperature range of 495 to 505°C for 2 to 6 hours,

quenching the high strength aluminum alloy casting after the solubilization, and

age hardening the high strength aluminum alloy casting by heating in a temperature range of 160 to 220°C for 2 to 6 hours after quenching.

9. A method of production as set forth in claim 8, wherein said method of production is a die cast method and further comprises the steps of closing mold halves, pouring aluminum melt into a melt sleeve of a die cast machine, then using an injection plunger to close a melt

pouring inlet of the die cast machine and reducing the pressure in the mold to not more than 13.3 kPa and filling a high strength aluminum alloy in the mold after reducing the pressure.

10. A method of production as set forth in claim 8, wherein said method comprises the steps of closing mold halves, pouring aluminum melt into a melt sleeve of a die cast machine, then using an injection plunger to close a melt pouring inlet of the die cast machine and reducing the pressure in the mold to not more than 13.3 kPa, adjusting the atmosphere by blowing in oxygen of a pressure of at least atmospheric pressure, and filling a high strength aluminum alloy in the mold after adjusting the pressure.

11. A method of production as set forth in claim 8, wherein said method comprises the step of closing mold halves, and further comprising a melt sleeve of a die cast machine, then using low speed die casting to fill high strength aluminum alloy into the mold while advancing an injection plunger at a low speed so as to keep air, heat decomposition gas produced from a release agent, etc. from being entrained.

12. A scroll for a compressor of an air-conditioner made from a high strength aluminum alloy casting as set forth in any one of claims 1 to 7.

13. A method of production of a scroll for a compressor of an air-conditioner made from a high strength aluminum alloy casting set forth in claim 9, comprising the steps of:

reducing the pressure inside the mold to not more than 13.3 kPa and filling the mold with a high strength aluminum alloy after reduction of pressure for die casting.

14. A method of production as set forth in claim 13, further comprising the steps of:

adjusting the atmosphere by blowing oxygen of a pressure of at least atmospheric pressure into the mold after the step of reducing the pressure inside the mold to not more than 13.3 kPa and

filling the high strength aluminum alloy into the mold for die casting after adjusting the atmosphere.

15. A method of production of a scroll for a compressor of an air-conditioner set forth in claim 12 using a method of production set forth in any of claims 8 to 11.

16. A vane rotor of a valve timing regulating device provided in a drive transmission system made from a high strength aluminum alloy casting as set forth in any one of claims 1 to 7.

17. A housing of an antilock braking system made from a high strength aluminum alloy casting as set forth in any one of claims 1 to 7.